PROJECT CONCERN INTERNATIONAL

Child Survival VII

Nicaragua Urban Child Survival Project
Managua: Barrio of Acahualinca
September 1, 1991 - September 30, 1994

Cooperative Agreement No. PDC-0500-A-00-1042-00

FINAL EVALUATION REPORT

SUBMITTED TO
THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR HUMANITARIAN RESPONSE
OFFICE OF PRIVATE AND VOLUNTARY COOPERATION

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Evaluation Team:
Olga Viluce
Alba Alvarado
Leonel Arguello
Richard Covington

Project Concern International
3550 Afton Rd, San Diego, California
Telephone: (619) 279-9690 Fax: (619) 694-0294

LIST OF TERMS

ARI	Acute Respiratory Infection
Brigadista	Community health volunteer
Casa Base	Home where oral rehydration salts and education are distributed
CDD	Control of Diarrhea1 Disease
c s	Child Survival
CSSP	Child Survival Support Program
DIP	Detailed Implementation Plan
EPI	Expanded Program of Immunizations
GM	Growth Monitoring
HIS	Health Information System
IEC	Information, Education and Communication
MINSA	Nicaraguan Ministry of Health
MOE	Ministry of Education
MOH	Ministry of Health
NGO	Nongovernmental Organization
Niño-a-Niño	PCI's peer health education program for students
ORS	Oral Rehydration Salt
ORT	Oral Rehydration Therapy
ORU	Oral Rehydration Unit (see casa base)
PC1	Project Concern International
PVO	Private Voluntary Organization

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I. PROJECT ACCOMPLISHMENTS AND LESSONS LEARNED

A. Proiect Accomplishments

A1. *State the objectives of the project, as outlined in the Detailed Implementation Plan.*

PROJECT CONCERN INTERNATIONAL
CHILD SURVIVAL PROJECT - ACAHUALINCA
FINAL EVALUATION SURVEY

No.	OBJECTWES	BSLN %	DIP %	FINAL %
1	Proportion of children between 12 and 23 months who are completely and correctly immunized.	59	80	72
2	Proportion of women 1545 years old who are completely and correct/y vaccinated against tetanus.	23	50	34
3	Proportion of mothers who know their child should receive his/her measles vaccine at 9 months of age.	42	80	51
4	Proportion of mothers who know that tetanus toxoid protects both the mother and the newborn.	45	80	36
5	Proportion of episodes of diarrhea in children under two occurring in the last two weeks treated with ORT.	57	80	69
6	Proportion of mothers of children under two who know the signs and symptoms of dehydration.	12	60	37
7	Proportion of mothers of children under two who know when to seek assistance from a trained health care provider for their child with diarrhea.	85	65'	96
8	Proportion of mothers of children under two who know the symptoms of moderate to severe respiratory infection requiring medical attention from the MOH health post.	85	60[2]	90

'During the final evaluation PC1 determined that the baseline data was improperly analyzed and therefore the objective was set below the baseline level. This report reflects reanalyzed baseline data.

'Ibid

9	Proportion of infants who are exclusively breastfed until they are at least four months old.	15	40	36
10	Proportion of children under two who are enrolled in a growth monitoring program.	37	60	51
11	Proportion of mothers who know that vitamin A prevents nightblindness.	5	40	10
72	Proportion of mothers with children under two who know which foods contain vitamin A.	25	40	35

The objectives above are those stated in the Detailed Implementation Plan (DIP) and/or response to the DIP review. Overall, PC1 was not able to achieve 100% of its stated objectives (Table Al), however, all but one objective showed significant improvement. This was confirmed by improvements in 82% of the Johns Hopkins CSSP indicators (Table A5). The objectives served as targets and should not be used exclusively to measure the success or failure of the project.

The project was favorably evaluated by the evaluation team and beneficiaries, who observed tangible results such as the training of the brigadistas, teachers, students and health post staff. Particularly notable were the increases in universal immunization coverage for infants, as well as the growth monitoring program's increase in attendance. Health post staff noted a decrease in diarrheal disease, which previously generated one quarter of the health post's clients. They also reported a decrease in cholera cases in this population. All these items pointed to successful education efforts.

A2. *State the accomplishments of the project related to each objective.*

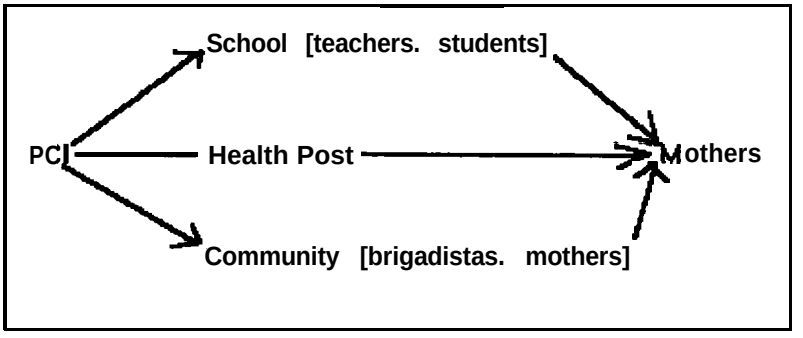
The table presented above in Al details the specific quantitative accomplishments related to each of PCI's objectives. Over the life of the project, a new mode1 for CS interventions was developed within the MINSA infrastructure and the community in order to reach the target population (mothers and children under 2 years of age). This mode1 was developed with three elements:

1- The "Modesto Bejarano" school in Acahualinca, through their teachers and the Niño-a-Niño program.

2- The "Miguel Aguilar" health post run by the Ministry of Health (MOH).

3- Direct communications with mothers through the Brigadistas program and the mothers of newborns group.

The following chart shows how this model worked:



Based on the results of the survey and group discussions, the evaluation team believed that this model was effective at delivering education and services to mothers of children under the age of two. At the same time, this methodology allowed PC1 staff to reach other members of the family (older brothers and sisters) as well as other community members (through campaigns, brigadistas and school-based activities).

A3. *Compare project accomplishments with objectives and explain the differences. Describe any circumstances which may have aided or hindered the project in meeting these objectives.*

Almost all project activities created improvements in knowledge, coverage, or behavior based on the results of the survey and group discussions. PCI's four staff members believed that the support of the community was critical for PCI's success in improving maternal and child health knowledge and practices. PCI's failure to achieve its objectives could be due to various external forces as well as overambitious plans.

In the mid-term evaluation, the evaluation team stated that PCI's staff were highly qualified and adequately performed their functions. However, their individual activities were multiple and varied to the point where it could become a problem. The same issues were observed under the final evaluation. The reporting and management requirements of operating a country office and a detailed child survival program prevented more time being spent with community groups. It could have been useful to incorporate into the project additional personnel (HIS specialists, promoters, nutritionists, hygienists) that would have reinforced much of the educational process and expand the activities of the project's technical staff. Nevertheless, this was not done due to budget restrictions and the resulting high cost per beneficiary.

There were other problems repeated in the individual and group interviews held. The MOH health post staff mentioned high turnover that restricted their capacity to address community health problems and the Mayor's office's lack of compliance in hygiene campaigns. Both resulted in PC1 staff spending more time than anticipated coordinating activities and training new MOH staff. Brigadistas mentioned that the limited economic resources of the community restricted their ability to face future activities without external aid. PCI/Nicaragua staff mentioned new migrants to the barrio (nearly 1,500) that were not planned for, but had to be included in the project's coverage.

The evaluation team believed the principal reasons for the project's achievements falling short of PCI's targets were the development of overly ambitious objectives and the unavailability of counterpart organizations. This CSVII project was PCI's first in Nicaragua, and initially, PC1 proposed working with the local non-governmental organization CEPS (Centro de Education para la Salud). When USAID/Nicaragua asked PC1 not to work with CEPS (after the proposal had been approved) due to political reasons, PC1 was unable to identify another local organizations in Managua with sufficient technical experience and financial controls to act as a responsible counterpart. In the end, PC1 assumed responsibility for the entire project without an increase in USAID funds. This placed fiscal burdens on the project which were exacerbated by economic stagnation and electricity shortages (there was no generator in the budget). The original objectives were therefore unrealistic. PC1 elected to maintain the objectives proposed under the DIP as targets for the project, fully knowing that they were only targets, and not the exclusive means of measuring the project's performance.

A4. *Describe any unintended benefits of project activities.*

The benefits of the health program exceeded PCI's initial estimates. Originally, PC1 did not expect Cholera prevention to be a large part of the control of diarrheal disease activities. By the end of the project, Cholera was a major focus, with MOH staff reporting low incidence levels when compared to neighboring communities. At the same time, the school's participation with the Nino-A-Nino program has created a very replicable and marketable program that USAID/Nicaragua will help PC1 to replicate in five additional communities of Managua. Sustainability was the target, with replicability being an unexpected benefit.

A5. *Attach a copy of the project's Final Evaluation Survey (annexed), and state the results for each relevant indicator (See Table below).*

PROJECT CONCERN INTERNATIONAL
CHILD SURVIVAL PROJECT - ACAHUALINCA
KEY INDICATOR OF CHILD SURVIVAL PROJECT PERFORMANCE

No.	KEY INDICATORS	RESULTS
1	Appropriate Infant Feeding Practices: Initiation of Breastfeeding - Percent of infants/children (less than 24 months) who were breastfed within the first eight hours after birth	193 / 314 = 61.5%
2	Appropriate Infant Feeding Practices: Exclusive Breastfeeding - Percent of infants less than four months, who are being given only breastmilk	39 / 44 = 88.6%
3	Appropriate Infant Feeding Practices: Introduction of foods - Percent of infants between five and nine months, who are being given so/id or semi-solid foods	68 / 70 = 97.1%
4	Appropriate infant Feeding Practices: Persistence of Breastfeeding - Percent of children between 20 and 24 months, who are still breastfeeding (and being given solid/semi-solid foods).	14 / 40 = 35%
5	Management of Diarrhea1 Diseases: Continued Breastfeeding - Percent of infants/children (less than 24 months) with diarrhea in the past two weeks who were given the same amount or more breastmiik	42 / 110 = 38.2%
6	Management of Diarrhea1 Diseases: Continued Fluids - Percent of infants/children (less than 24 months) with diarrhea in the past two weeks who were given the same or more fluids other than breastmilk	70 / 110 = 63.6%
7	Management of Diarrhea1 Diseases: Continued Foods - Percent of infants/children (less than 24 months) with diarrhea in the past two weeks who were given the same or more food	35 / 110 = 31.8%
8	Management of Diarrhea1 Diseases: ORT Use - Percent of infants/children (less than 24 months) with diarrhea in the past two weeks who were treated with ORT	75 / 110 = 68.2%
9	Pneumonia Control: Medical Treatment - Percent of mothers who sought medical treatment for infant/child (less than 24 months) with cough and rapid, difficult breathing in the past two weeks	77 / 707 = 76.2%
10	Vaccination Coverage (Card): EPI Access - Percent of children 12 to 23 months who received DPTl	139 / 143 = 97.2%

11	Vaccination Coverage (Card): EPI Coverage - Percent of children 12 to 23 months who received OPV3	126 / 143 = 88.1%
12	Vaccination Coverage (Card): Measles Coverage - Percent of children 12 to 23 months who received measles vaccine	122 / 143 = 85.3%
13	Vaccination Coverage (Card): Drop Out Rate - Percent change between DPTI and DPT3 doses [(DPT1-DPT3)+DPT1]x100 for children 12 to 23 months	(97.2-86) / 97.2 = 11.5%
14	Maternal Care: Maternal Card - Percent of mothers with a maternal card for the birth of the youngest child less than 24 months of age	165 / 314 = 52.5%
15	Maternal Care: Tetanus Toxoid Coverage (Card) - Percent of mothers who received two doses of tetanus toxoid vaccine (card) before the birth of her youngest child less than 24 months of age	125 / 314 = 39.8%
16	Maternal Care: One or More Ante-Natal Visits (Card) - Percent of mothers who had at least one ante-natal visit (card) before the birth of her youngest child less than 24 months of age	137 / 314 = 43.6%
17	Maternal Care: Modern Contraceptive Usage - Percent of mothers of children less than 24 months of age who desire no more children in the next two years, or are not sure, who are using a modem contraceptive method	161 / 258 = 62.4%

B. Project Expenditures

Bl. *Attach a pipeline analysis of project expenditures*

This is included as appendix 2.

B2. *Compare the budget contained in the approved DIP with the actual expenditures of the project. Were some categories of expenditures much higher or lower than originally planned? Please explain.*

The budget submitted in the DIP did not take into full account the financial burden caused by PCI's decision to operate in Nicaragua without a local counterpart. When PCI's approved counterpart was restricted from the project due to political motives, PC1 did not have sufficient experience in Nicaragua to accurately estimate the real operating costs for the project. As the final pipeline shows, costs related to consultants for evaluations were cut by 75%, with the savings being used for other direct costs related to the maintenance of an office. Other line items were close to the budgeted amounts. In the end, PC1 used funds from its headquarters portion of the CSVII grant in order to maintain operations in Nicaragua.

B3. *Were project finances properly handled?*

The evaluation team observed that the budget was administratively flexible while still assuring the proper management of the project. The project was carried out responsibly, combining the needs of the community with the fiscal limits of the budget. The project was active with the funds received, but activities such as the final evaluation received less than optimal funding due to fiscal restrictions. The financial limitations were managed by applying policies of austerity until the end of the project. This may have limited the accomplishment of the objectives.

B4. *Were there lessons learned regarding project expenditures that might be helpful to other PVO projects, or relevant to USAID's support strategy?*

The small size of this project still required the same burdensome amount of reporting and evaluation that larger CS projects required. There were insufficient funds available for technical support for the project particularly in the HIS components. However, the support from Johns Hopkins, made available without cost, was invaluable.

It was the opinion of those interviewed and the evaluation team, that there should be a second phase in this project to consolidate the results and create conditions in which the health posts, schools, beneficiaries and all those involved in health issues could continue to perform the activities needed over the next 3-5 years. The three year timeline was insufficient to allow for full sustainability. This should be seriously considered by PVOs and the donors, taking into account that three years is not enough time to guarantee lasting results in a population that has limited economic, health and material conditions.

Future project expenditures, particularly in expenses such as salaries, material support for training activities and operating costs need to be calculated at higher levels. PCI's inexperience in Nicaragua resulted in a budget with insufficient funds. The project should have planned for more field personnel to support the work since the main component of the project was training. Some expenses not included were vehicle insurance, vehicle taxes, and importation costs.

C. Lessons Learned

Outline the main lessons learned (regarding the entire project) which are applicable to other PVO C.S. projects, and/or relevant to USAID's support of these projects.

After a CS project ends, many relations and activities are often abandoned and their continuity is not guaranteed. It is the opinion of those interviewed and the evaluation team, that there should be a second phase in this type of project to consolidate the results and create conditions in which the health post, school, beneficiaries and all those involved in health issues can be able to finance and perform the activities needed to preserve the achievements, at least for a 3-5 year period. This should be seriously considered by PVOs and donors, taking into account that three years is not enough to guarantee lasting results in a population with limited economic, health and material resources. This

is especially true when only 2 of 3 years are spent improving health indicators, and one year is used for contracting staff, staff training, establishing an office, undertaking surveys, writing and submitting reports, etc.

It is also important to consider that the local health posts survive without a great deal of central level support. The MOH only covers salaries of medical and auxiliary personnel, some drugs, materials and stationary. In the "Miguel Aguilar" health post in Acahualinca, the rest of their needs are covered by a voluntary contribution of one cordoba (equivalent to US.SO.14) paid by those patients who can afford the fee. In this way, they collect around six hundred cordobas (around US$85.00) monthly to pay a watchman, cleaning materials, batteries for flashlights (the health post has no electric lights due to a defective electric system that they have not been able to fix), transportation of patients to other centers, and the moving of thermoses twice a week to maintain the vaccine cold chain. With this level of budget, the health post is absolutely unable to assume any costs to sustain CS health education and outreach activities. Moreover, with PCI's effective CS activities, the services demanded by the population from the health post have increased (from 10-l 2 patients daily to 60) and they are barely able to maintain this level of service. Therefore, it was not realistic to believe that the MOH could assume sole financial responsibility for this project's continuation.

II. PROJECT SUSTAINABILITY

A. Community Participation

Al. *Please identify community leaders and members interviewed and indicate which group(s) the leaders represent.*

Jairo Guerra - Niño-a-Niño Program promoter
Fabio Silva - Director of the local school
Lit. Maria Canales - Health Center Director
Socorro Hemandez - Brigadistas' Coordinator
Jamilleth Perez - Mothers Group Coordinator (and brigadista)

A2. *Which child survival activities do community members and leaders perceive as being effective at meeting current health needs?*

Niño-a-Niño Program:

The evaluation team witnessed the Niño-a-Niño participants present a puppet show and a group exercise consisting of balloons that the children exploded in random order, and answered questions contained inside. The evaluation team also held some key-informant interviews. All of these activities clearly demonstrated that the children retained knowledge regarding health themes, such as: breastfeeding, diarrhea, respiratory diseases, nutrition, hygiene, cholera, Vitamin A, and immunizations. Children demonstrated great enthusiasm and a capacity to retain concepts. The evaluation team considered their work attitude as very serious and dedicated. They knew the

prerequisites and methodology of the Niño-a-Niño program and reached people beyond the CS project beneficiaries, They have gained community respect and self-confidence as stated by themselves, their teachers, and also by the health post personnel.

The obvious leaders were the oldest children and/or those who have been in the program the longest. They did not require elaborate supervision to be well organized, have self-control as a group, and maintain control of the audience. The Niño-a-Niño program has used other means of communication such as fables, theater, songs, videos, etc. to reach students and community members.

At the time of the evaluation, there were 35 children in the Niño-a-Niño program (fourth, fifth and sixth graders). The high level of student participation and interest encouraged other students to become brigadistas (community health volunteers) in the future. Two former Niiio-a-Nifio participants became brigadistas during the life of the project.

Several activities are planned to help support the program once PC1 funding ends, such as lotteries, parties and other school activities. These funds will be used to buy materials they need for their performances. There was a real desire among students and teachers to continue the program into the foreseeable future. The only limitation identified by the evaluation team was financial.

School Teachers:

The teachers played an important role in community health promotion. In a test given during the evaluation process, they demonstrated good knowledge of all project interventions. The percentage for each intervention refers to correct answers given (test included in appendix). The purpose of the test was for PC1 to see in which areas retention was weakest. Overall the evaluation team did not find any area as significantly "weak". The results were as follows:

Immunization	83%
Diarrhea	89%
ARI	87%
Vitamin A, Nutrition, Maternal Breastfeeding	88%
Total	86%

During a group discussion, the teachers stated that during the project they achieved the following results, which they considered as very positive:

A better integration between child and teacher.
New knowledge in health matters, which allowed them to help the community through recommendations to parents and children.
Detect diseases by their symptoms and help the children to prevent and cure them.
Brought together the community around the environment, personal hygiene and "food hygiene".
Increased school attendance due to lower sickness levels.

Increased participation of the school and community in health activities.

Briaadista Movement:

The evaluation team met with a group of brigadistas. All active brigadistas were invited, with 25 attending the meeting. Their ages ranged from 11 to 38. In this group, 10 were male and 15 female. They performed a role-play exercise entitled "Treating Health" that presented a doctor not terribly interested in the patients' illnesses and symptoms and that prescribed drugs without even touching the patients. There was a case of a child presenting fever and diarrhea during the last three days. The doctor gave a prescription that the mother could not buy. She came back to the doctor, but he just insisted upon the prescription. The mother then talked to the brigadistas and they recommended ORT, give liquids to the child and not to stop breastfeeding. The presentation reflected a satire against deficient medical attention and the important role played by the brigadistas in helping the worried mother take care of her child. The performance outlined the good knowledge of the brigadistas in facing a diarrhea case and calming down the mother.

The brigadistas' day-to-day activities included the referral of cases to the health center, the follow-up of pregnant women, participation in health and hygiene campaigns and house-to-house visits to mothers with children under two years of age. They have been involved in campaigns to prevent cholera, although it is not a CS intervention, due to the barrio's unhygienic conditions.

They stated that with their work they gained experience, knowledge and fluency with the mothers. They have also gained respect in the community and usually the mothers take into consideration their suggestions. They did not report problems with credibility.

The evaluation team distributed a written knowledge test to the 25 brigadistas, in which they demonstrated very good knowledge of all the project interventions. The percentage for each intervention refers to correct answers given in the test (included in appendix). The results were as follows:

Immunization	98%
Diarrhea	97%
ARI	93%
Vitamin A	90%
Maternal Breastfeeding, Nutrition and Hygiene	98%
Total	95%

Another activity in which the brigadistas were involved was latrine promotion. They trained the beneficiary families about its advantages, use, construction and importance. They also worked in environmental hygiene by covering holes that fill with water during the rainy season, destroying the main vectors for mosquitos, and explaining to the community the need to clean their houses and patios.

Mothers of Newborns:

The evaluation team also met with a randomly selected group of mothers who attended the mothers with newborn children meetings over the past 2 years. In the meeting there were 15 mothers present who looked very proud of their healthy children. It was the opinion of all the members of the evaluation team that the mothers in general had retained the messages given in the training, reported modified habits, and had a cooperative attitude among them.

All the mothers expressed that they started breastfeeding their babies immediately after delivery because, "all babies are born hungry". A few of them faced some problems breastfeeding their children. One mother described how her baby refused her breast, in which case the mother milked herself and gave it to the baby in a bottle. In two cases, the mothers said that they felt sick while breastfeeding. However, they stated that they never stopped nursing their babies.

It is important to outline that only two mothers present were first-time mothers. The mean was 3-4 children. Nevertheless, they did not refuse training. They incorporated their previous experiences in adapting the new concepts, and transmitted their experiences to first-time mothers.

During the meeting, a brigadista performed a group exercise having a mother roll a large cardboard cube and answer the question written on the side of the cube, regarding maternal breastfeeding and immunizations. They all gave correct answers, using their own words and incorporating their personal experiences.

The health center usually invites the mothers' to the meetings by visiting them. The brigadistas work with the mothers, listening to their problems and introducing new concepts to explain the diseases, and their causes, how to prevent them and what to do in each case.

The mothers said that in these meetings they have learned to detect diseases, and have more control over vaccinations. They suggested that more topics should be incorporated in the meetings, and that they should incorporate more mothers into this movement.

A3. *What activities did the PVO carry out to enable the communities to better meet their basic needs and increase their ability to sustain effective child survival project activities?*

In order to reach more families, PC1 strengthened the brigadista movement in the community and the mothers of newborns group. PC1 also increased the coordination between the brigadistas, health post staff, teachers, students and NGOs. PC1 informed the families about MOH health services and encouraged them to use the health post. The Niño-a-Niño program also reached families not otherwise involved in local health activities.

PC1 worked to increase the basic health knowledge of family members in order to address and treat illnesses in a timely manner. As one example of family participation, the team noted diarrhea, where the use of ORT has increasingly been advocated at the health post, ORUs, mothers' groups and by

brigadistas. PC1 has encouraged the active participation of families in all the information, education and health promotion activities, such as vaccination, training, and chlorination. This lead to a decrease in the incidence of many diseases (such as the reduction reported for diarrhea).

The project carried out a number of IEC (Information, Education and Communication) activities directed at the community including: puppet theaters, flip-charts, posters, folders, murals and the use of a loudspeaker on a car to promote activities. IEC materials were incorporated into training sessions and were used during house-to-house visits to repeat and reinforce health messages. The project distributed pamphlets, signs and folders, all of which were designed and developed very simply by the project staff utilizing the project's computer and photocopier. PC1 also reproduced and distributed materials developed by the MOH. All these materials used similar messages to promote community health. Based upon the evaluation team's observations, the education given by the project personnel was representative of the child survival health risks encountered in Acahualinca.

All the interviewed groups agreed that the materials were simple, low cost, useful, and of great value. The materials used for house-to-house visits and the messages directed to the mothers were cited as examples of valuable materials. The brigadistas, teachers, and health personnel all felt better prepared to perform quality health education in the community. The brigadistas, in particular, felt that they learned a great deal about community health from the printed materials.

A4. *How did communities participate in the design, implementation and/or evaluation of child survival activities?*

During the design of the project and development of the DIP, the community participated in the discussion of the project's strategies and interventions through the national, regional and local Community Movement. They discussed the approved project and suggested other interventions such as family planning, cholera prevention and hygiene.

During project implementation the community members attended training activities, contributing with the following total amount of hours:

Brigadistas	6,920
Child's Promoters	6,580
Newborns' Mothers	7,812
MOH personnel	1,920
MOE personnel (teachers)	1,541
TOTAL	24,773

Their participation was extensive in health campaigns and the promotion of new health practices, with the following outputs:

PROJECT CONCERN INTERNATIONAL
CS VII PROJECT
VOLUNTARY HOURS PROVIDED BY THE COMMUNITY

ACTIVITY	BRIGADISTAS	CHILD PROMOTERS	MOE PERSONNEL	MOH PERSONNEL	TOTAL
Vaccination Campaigns	1,674	36	155	416	2,281
Hygiene Campaigns	436	356	320		1,112
House-to-House visits	1,358				1,358
Puppet shows		278			278
Conferences	165		232	45	442
Census	190				190
TOTAL	3,823	670	707	461	5,661

During the final evaluation the team had the opportunity to met the promoters of the Niño-a-Niño program, the teachers of the "Modesto Bejarano" school, the brigadistas, and the "Miguel Aguilar" health post staff in Acahualinca. In all cases, they had great disposition, were encouraged to tell the team their opinions, suggestions and experiences and requested PC1 to continue their work with them since no other organization had ever helped them in the same way.

At the same time, they participated in the final evaluation by performing presentations, answering questions, taking written tests about their knowledge levels, and suggesting ideas to improve CS project activities.

AS. *What is the number offinctioning health committees in the project area? How often has each met during the past six months? Please comment on whether committee members seem representative of their communities.*

The project did not use "committees" for implementation (though there was a community health committee) because the model for CS interventions designed reached the target groups without going through the health committee. The health post worked with the health committee in Acahualinca and acted as the bridge between project implementation and committee activities.

The community groups that participated in the CS VII project were Niño-a-Niño, Brigadistas, mothers and teachers.

A6. *What are the most significant issues currently being addressed by these health committees?*

Not Applicable

A7. *Please give specific examples of the methods used by the committees, and of their precise role in providing direction to the project.*

Not applicable

AS. *What resources has the community contributed that will encourage continuation of project activities after donor finding ends?*

The community's contribution consisted of the 30,805 (24,773 training, 5,661 events) voluntary hours. If calculated according to the minimum wage for Nicaragua (C$600 monthly), at the current exchange rate of C$6.74/US$1, they made a total contribution of US$16,932.

A9. *What are the reasons for the success or failure of the committees to contribute resources for continuation of effective project activities?*

Not applicable.

B. Ability and Willinmess of Counteruart Institutions to Sustain Activities

Bl. *Please identify persons interviewed and indicate their organization and relationship to the child survival project.*

Fabio Silva - Director of the local school, closely worked with the Niño-a-Niño program and teachers.
Lit. Maria Canales - Health Center Director, worked with the brigadistas and groups of mothers of newborns.

B2. *What linkages exist between the child survival project and the activities of key health development agencies (local/municipal/district/provincial/state level)? Do these linkages involve any financial exchange?*

Due to financial restrictions, linkages did not include financial exchange.

Brigadistas referred children with severe diarrhea to the oral rehydration units or the health post. When appropriate, the oral rehydration units referred to the Miguel

Aguilar Health Post in Acahualinca. The referral of the patients to superior care levels occurred when the patients needed specific attention which the health post did not provide. Patients were referred to La Morazan Health Center by the health post. The La Morazan Health Center (responsible for multiple communities similar to Acahualinca) is located in the urban zone next to Acahualinca. These health centers have some limitations, mainly related to communications.

Hospital Fernando Velez Paiz and Hospital Lenin Fonseca are only accessible by public transportation, The patients referred to these hospitals by health centers required secondary attention. The quality of the services reflected the general limitations of the country's health care system. Hospital Berta Calderon and Hospital Infantil La Mascota were alternative referral sites. These were hospitals for national referrals. They were less accessible geographically than those mentioned above.

The relationships between the health posts, La Morazan Health Center and other secondary care units, were established through the administration lines of the MOH using their system of referral and counter-referrals. This was characterized by little continuity and feedback. The project did not establish a direct relationship with the secondary referral centers.

B3. *What are the key local institutions the PVO expects to take part in sustaining project activities?*

There were three counterpart organizations for the project: the Ministry of Health (MOH) (as represented by the local health post), the Ministry of Education (represented by the Modesto Bejarano Primary School) and the community (represented by the brigadistas, health commission, and the monthly mothers of newborns group). The project maintained a close working relationship with all these organizations. All the activities of the project were performed in mutual collaboration, where the PVO provided the material and human resources required for the training sessions and the counterparts provided volunteer work and outreach. The activities could not be carried out without the contribution of time and dedication from all the different institutions and groups of volunteers.

B4. *Which child survival project activities do MOH personnel and other staff in key local institutions perceive as being effective?*

For the last year and a half the health post maintained their own information system; with training and assistance from PCI. With this information the MOH provided feedback to the population and the volunteer health workers in order to measure their efforts and direct the work according to the community's needs. From this information system they developed an epidemiological map of Acahualinca and updated it constantly with the information they gathered.

The health post personnel noted an increase in the demand for health services, specifically in the areas of CDD, prenatal care, immunizations, infant illness and medical consultations. All of these services were promoted by the voluntary health workers in close coordination with the MOH personnel. They felt that due to the increase in demand, the health post staff contributed all their resources to satisfy the increased requirements.

The MOH staff felt that the post could initiate more activities to increase the effectiveness of their services if resources were available. The health post staff felt that the post could do more in the way of direct promotion and educational activities, actually done mainly by the Brigadistas, to continue the increase in demand for maternal and child health services, thanks to all the training received during the project activities.

They mentioned that additional services were required by the community, including: potable water, sanitation/drainage, and food. They also recommended including and giving priority to the population living in the municipal garbage dump.

B5. *What did the P VO do to build skills of focal MOH personnel or staff of key counterpart NGOs? Did they teach them to train Brigadistas, or manage child survival activities once A.I.D. funding terminates?*

PC1 trained 16 health workers. This included not only the "Miguel Aguilar" health post staff, but "La Morazan" health center staff as well. The hours of training received by health workers during the life of the project were as follows:

Diarrhea	10 hours
ARI	10 hours
Maternal Breastfeeding	10 hours
Immunization	10 hours
Nutrition, Vitamin A	20 hours
Growth Monitoring	6 hours
Prenatal control	6 hours
Hygiene	8 hours
Cholera	8 hours
Family Planning	26 hours
Activities planning	6 hours
TOTAL	120 hours

The evaluation team distributed a written knowledge test to the four MOH health post personnel in four CS interventions (test included in appendix). The results were as follows:

Immunization	100%
Diarrhea	100%
ARI	98%
Maternal Breastfeeding	81%
Hygiene	92%
Vitamin A	100%
TOTAL	**95%**

The lower level of breastfeeding knowledge will stimulate PC1 to focus more attention on MOH breastfeeding education in future projects. Unplanned training sessions on prevention and management of cholera were held at the request of the health post staff. The staff reported that PC1 was the only organization that offered them regular training, and they believed it improved the quality of care they were able to provide. The MOH staff of Acahualinca were not invited to MOH trainings held in "La Morazan" health center, due to coordination problems. PC1 invited staff from both locales for most training sessions.

Integrated child services was a strategy PC1 implemented to enable the health post staff to talk with mothers of newborns and young infants at the group meetings held monthly. At these meetings, new mothers were provided with information on and support for breastfeeding, immunizations, and early stimulation of newborns. At the same time, health post staff enrolled infants into the growth monitoring program.

PC1 also worked to integrate the health post and the brigadista movement. Now they are capable of training, supervising and managing the brigadistas to support the CS activities and health campaigns of the MOH.

B6. *What is the current ability of the MOH or other relevant local institutions to provide the **necessary financial**, human, and material resources to sustain effective project activities once CS finding ends?*

The evaluation team believes that the counterparts posses the technical capacity and aptitude necessary to address the CS activities. PC1 is developing mechanisms to pass on to the counterparts a training methodology which will include the lessons learned from PCI's experience. It is expected that the school teachers' will be of great help to sustain CS interventions with the knowledge gained during PCI's CS project in Acahualinca.

Nevertheless, there may be external factors that could limit the advance and threaten the continuation of the CS activities, for example, the high rotation of health post personnel and MOH as well as MOE budget limitations to sustain the Niño-a-Niño component and the brigadistas movement.

B7. *Are there any project activities that counterpart organizations perceived as effective?*

The following activities were mentioned by individuals interviewed by the evaluation team:

> With the community participation in the hygiene campaigns, the population improved their personal and environmental habits,
>
> Decreased levels of diarrhea, mortality and cholera, due to changes in the hygiene habits with the work performed by the brigadistas in the house-to-house visits, community ORUs and hygiene campaigns, as well as the activities carried out with the groups of mothers.
>
> Children voluntarily attended vaccination campaigns and carried their brothers and sisters with them, which was a result of the work performed by child promoters and brigadistas.

B8. *How have major project responsibilities and control been phased over to local institutions? If this has not been done, what are the plan and schedule?*

PC1 progressively phased over HIS management responsibilities to the MOH health post. After training, the health information was collected by the health post and processed and analyzed with the health personnel, according to PCI's advice and training, before being sent to a higher level (La Morazan health center). The results were discussed with community leaders, brigadistas, mothers, and other interested NGOs. These were forums to receive suggestions and opinions. Little qualitative data was being kept by the health post.

In the interview held by the evaluation team with the MOH personnel, they stated that since PC1 arrived, they have been able to look at local health information. This never happened before. Just a few years ago, they sent information to the La Morazan health center and never received feedback, nor worried about it. After PCI's assistance, the regional health center agreed to provide feedback on the information generated by the health post. In most cases, the feedback did not agree with the original information sent to the regional center. The health post was trained to manage its own information and dismiss the information from the health center what they considered invalid; backing up their position with their statistics and their precise knowledge of the community's health conditions.

The knowledge shared through formal and informal opportunities improved PCI's ability to phase over responsibility for selecting training topics, coordinating mini-campaigns for vaccinations, and supporting community-wide hygiene campaigns to the health post. The increased local awareness of health issues mentioned by teachers, mothers, voluntary health workers and the local health post personnel in separate interviews, was a key step in the process of community ownership of project activities.

There was very little service provision by PC1 in this project. All services were appropriately provided by the health post or by the 11 active oral rehydration units within the community and managed by volunteers. There was close coordination between the different health actors and the community. Specific examples include hygiene and vaccination campaigns, house-to-house visits, and the referral of children at risk of dehydration. The health post was the principal referral site promoted by the health program's participants.

With the training received and the experience accumulated through PCI's CS project, the MOH is capable of, and currently assuming, the training responsibilities for the Niño-a-Niño program, newborn mothers group and brigadista program, as well as the health and hygiene campaigns. The only limitation they foresee is the lack of resources to cover recurrent costs.

B9. *Did any counterpart institutions (MOH, development agencies, local NGOs, etc.), during the design of the project (proposal or DIP), make a financial commitment to sustain project benefits? If so, have these commitments been kept?*

The counterpart institutions did not made any financial commitment to sustain the project benefits during the life of the project.

B10. *What are the reasons given for the success or failure of the counterpart institutions to keep their commitment?*

Not applicable.

B11. *Identify in-country agencies who worked with the PVO on the design, implementation, or analysis of the midterm evaluation and this final evaluation.*

There were four other NGOs working in Acahualinca:

- Asociacion Cristiana de Jovenes (ACJ) - their scope of work was directed at preventive health care (training), ecology, social research, recreation, culture, youth leadership and family.

- Centro de Information, Servicios y Asesoria en Salud (CISAS) - their scope of work was directed to assistance in participative health education methodologies,

Fundacion Nicaraguense para la Conservation y el Desarrollo (FUNCOD) - their work was directed at different environmental projects.

PRO-FAMILIA - a private institution with activities in the field of family planning.

These NGOs have been able to bring together different scopes of work (youth, consulting, the environment) by sharing common interests with other organizations. In the case of PCI/Nicaragua the common interest was health training. A positive aspect was the coordination between different groups in relation to the Niño-a-Niño program. For example, PC1 has worked with CISAS to develop its training program. They provided PC1 with participative education methodologies for the Niño-a-Niño program.

PRO-FAMILIA participated and supported the activities of maternal health at the health post and, in particular, with regard to family planning. They provided contraceptives and counselling to mothers. With PRO-FAMILIA, a more direct and efficient referral system was implemented, responding to the activities and the relationships established by the project.

It is important to note that, despite the diversity of organizations working in the community, there have not been conflicts nor organizational problems, particularly with the work of the brigadistas and the community leaders. This is due in part to the cohesive attitude of PCI/Nicaragua which promoted NGO unity.

C. Attempts to Increase Efficiency

C1. *What strategies did the PVO implement to reduce costs, increase productivity, or otherwise make the project efficient?*

Costs were kept to a minimum throughout the project due to the limited budget available. Originally PC1 anticipated receiving support from CEPS to support administrative and office costs. When this relationship was prohibited, PC1 assumed the financial responsibility for all project costs without an increase in the USAID portion of the budget. This forced PC1 to work as efficiently as possible for the duration of the project.

Productivity was improved within the health post by providing additional training to staff and helping to develop management and health information systems that allowed people to do their jobs in less time. This component of the project was very successful, with the health post able to cover four times the number of patients seen each day. Systems developed included tracking and filing schemes for children's immunization records, and nutrition card records. The health post staff reported that people arrived in better physical condition (or sooner in the illnesses cycle) allowing them to spend a little less time with each patient.

c2. *What are the reasons for the success or failure of the attempts to increase **efficiency** of this project?*

All elements of the sustainability plan were pursued. The drug fund failed because in the revised budget there were no funds available to buy drugs. At the same time, no portion of the population was capable of paying for them, particularly when the MOH subsidized the retail cost of medicines.

The health post staff reported an improved relationship with the community. In addition, the health post personnel cited the project's success in increasing the community's use of the health post and a decrease in child mortality. The number of patients at the health post increased from 1 O-12 patients daily to approximately 60 (especially young children who come into the post in less serious conditions than previously). The community was able to control several diseases such as cholera (which they expected to have a higher incidence in the barrio) and a initiate a decrease in diarrhoeal disease.

The health post staff expressed to the evaluation team that the project reached and surpassed the Child Survival targets planned by the MOH. This achievement can be attributed to the training process and the selection of health education topics that were of direct interest to the community. The MOH is financially only able to continue Child Survival interventions such as growth monitoring and vaccinations. They are disposed to continue the Niiio-a-Nifio and Brigadistas programs, but financial restrictions make it difficult. Nevertheless, MOH staff are prepared to back these efforts with training, coordination, and the implementation of new training topics (e.g. the healing of minor wounds, and others).

C3. *Are there any lessons to be learned regarding attempts to increase **efficiency** that might be applicable to other PVO child survival projects or to **USAID's** support of these projects?*

The single most important lesson learned by PC1 was that the USAID Mission could withdraw support for a project counterpart previously approved, and to be prepared to increase efficiency and flexibility in a project already underfunded. This was accompllshed by drastically cutting the funds available for evaluations. With regard to project operations, PC1 staff believed that the most important improvements with regards to efficiency were made within the health post. Training and support for the MOH staff made great improvements in their ability to cover more patients without an increase in resources. Providing training to existing service structures was more efficient than developing parallel structures (e.g. another clinic).

D. Cost Recovery Attempts

D1. *What specific cost-recovery mechanisms (i.e., revenue-generating measures) did the PVO implement to offset project expenditures? If cost recovery was part of the project, who managed implementation?*

The drug revolving fund stated in the DIP was one such idea. Once the project started, PC1 found that it was impossible to go ahead with that idea, because in the revised budget there were no funds available to buy drugs. At the same time, no portion of the population was capable of paying for them. Other ideas such as household gardens were proposed under CSX **but** were not approved for funding.

D2. *Estimate the dollar amount of costs recovered during the project. What percent of project costs did this revenue cover? Did the cost recovery mechanisms generate enough money to justify the effort and funds required to implement the mechanisms?*

There were no cost recovery actions implemented by the project.

D3. *What effect did any cost recovery activity have on the PVO's reputation in the community? Did the cost recovery venture result in any inequalities in service delivery?*

There were no cost recovery actions implemented by the project.

D4. *What are the reasons for the success or failure of the household income generating activities of this project?*

There were no household income generating activities in this project. These activities were planned for future years if funding was renewed.

D5. *Are there any lessons to be learned regarding cost recovery that might be applicable to other PVO child survival projects or to USAID's support strategy?*

With the specific beneficiaries defined under this CS project in Nicaragua, it is impossible to consider cost recovery without including micro enterprise or economic development activities. This must be seriously taken into consideration by PVOs and donor agencies. It is unrealistic to believe that in three years an organization would be able to simultaneously pursue both health and microenterprise activities in a community receiving external Child Survival assistance for the first time,

E. Household Income Generation

E1. *Did the project implement any household income-generating activities?*

There were no household income-generating activities implemented in this project. These activities were planned in the CS X proposal submitted to AID/Washington.

E2. *Estimate the dollar amount of income added to a family or household's annual income, as a result of the income- generating activity of the project.*

Not applicable.

E3. *Did the revenues contribute to meeting the cost of health activities? What percentage of project costs did income generation cover?*

Not applicable.

E4. *Are there any lessons to be learned regarding household income generation that might be applicable to other PVO child survival projects or to A.I.D.'s support strategy?*

Not applicable.

F. Other

F1. *Describe what sustainability-promoting activities were actually carried out by the PVO over the lifetime of the project.*

The project attempted to sustain the delivery of the child survival interventions through three major components:

1) Continued participation of voluntary health workers and the community in all project activities. The continued participation of Brigadistas and the community was achieved through a sense of ownership of the program. The participation of the community members and leaders in the project's activities gave them a measure of control over the project, self-confidence, made them capable to give advice on health matters, and gained respect from the community. Brigadistas were encouraged by PC1 to continue their participation through a number of non-material incentives, such as continuing education, provision of books and educational materials, etc.

2) Maintenance of quality management and promotion of CS interventions within the MOH and MOE. The MOH and school components have the most potential for sustainability because all project activities were done mainly through MOH and MOE structures. No parallel structures were created. MOH

and MOE personnel were trained and systems improved. The MOH and MOE paid for salaries, and supplies were provided by PC1 to improve the capacity of the personnel and sustain them.

3) Maintenance of school activities, mainly through the Niño-a-Niño Program. PCI's staff have supported the Niño-a-Niño Program. This movement of 25 active volunteers was organized according to the counterpart roles in the project. PC1 helped to motivate them and make them feel integrated into the project by providing materials, training and logistics for their activities, even beyond the project's area.

PCI's staff have supported volunteer brigadistas, teachers, school children, and mothers' groups. This movement of 315 volunteers was organized according to the counterpart roles in the project. This led to effective communication and coordination in health training and promotion.

All the volunteers felt that their workload was reasonable. Many mentioned that the manner in which their training and job responsibilities were organized allowed them to perform the tasks requested of them. The brigadistas expressed that their job distribution within the child survival project was adequately planned through consensus decision making, taking into account the time they had available and other parameters. The health post staff mentioned that the time allowed for training always included opportunities to ask questions (in order to clarify ideas), receive in-depth answers (to solidify concepts), and use audio visual tools (to motivate learning).

Other than salaries, the only incentives mentioned that motivated PC1 staff, volunteers and project counterparts were the "fruits of their labor". This included personal satisfaction, increased prestige, or other non-monetary rewards. The cohesiveness of the group and their committed participation were based on their ongoing belief in, and commitment to, the health education activities. Everyone involved in the project demonstrated that they felt valued and encouraged by PCI/Nicaragua.

F2. *Indicate which aspects of the sustainability plan the PVO implemented satisfactorily, and which steps were never initiated. Identify any activities which were unplanned, but formed an important aspect of the PVOs sustainability effort.*

All elements of the sustainability plan were pursued. The drug fund failed because in the revised budget there were no funds available to buy drugs. At the same time, no portion of the population was capable of paying for them.

The health post staff reported an improved relationship with the community (unplanned). In addition, the health post personnel cited the project's success in increasing the community's use of the health post and a decrease in child mortality.

The number of patients at the health post increased from lo-12 patients daily to approximately 60 (especially young children who come into the post in less serious conditions than previously), the control of several diseases such as cholera (which they expected to have a higher incidence in the barrio) and a decrease in diarrhoeal disease.

The health post staff expressed to the evaluation team that the project reached and surpassed the Child Survival targets planned by the MOH. This achievement can be attributed to the training process and the selection of health education topics that were of direct interest to the community. The MOH is financially only able to continue Child Survival interventions such as growth monitoring and vaccinations. They are disposed to continue the Niño-a-Niño and Brigadistas programs, but financial restrictions make it difficult. Nevertheless, MOH staff are prepared to back these efforts with training, coordination, and the implementation of new training topics (e.g. the healing of minor wounds, and others).

F3. *What qualitative data does the PVO have indicating a change in the sustainability potential of project benefits?*

All persons interviewed outlined the good work performed by PC1 staff during the life of the project, which empowered them to continue the health activities. All of them suggested ideas and mechanisms to generate funds to finance the activities, due to the fact that their main reason not to continue alone was their limited economic resources. They also stated that PC1 staff should stay longer to help them in the training process.

The brigadistas stated that the project empowered them to address the needs of their barrio and solve health issues. The brigadistas also said that by empowering themselves, they are empowering the community as a whole. The brigadistas felt that the training and project management performed by PC1 motivated them and made them feel integrated into the project. Now they do not feel like "brigadistas jomaleros", which means that they previously worked only in vaccination campaigns and did not feel involved in the solutions to community health problems. They considered themselves an integral part of the community health infrastructure.

The teachers reflected that the training process helped them as much as the students. Through the project, the teachers gained an awareness of both sanitation issues and student health issues. The work developed through the project was an important factor in linking the school with the community.

Another important aspect mentioned was the communication established between the Niño-a-Niño program, teachers, brigadistas and the health center. All of them as a whole have the will to continue the work started with PCI's project. Now they understand the needs and problems of the barrio, and have learned how to face them by involving the community.

III. EVALUATION TEAM

A1. *Identify by names, titles and institutional affiliations all members of the final evaluation team.*

Olga Viluce -	External Evaluator
Alba Alvarado -	External Consultant
Leone1 Arguello-	PCI/Nicaragua
Rich Covington -	PCI/HQ

A2. *Identify the author of the evaluation report.*

Lit. Olga Viluce was the coordinator and author responsible for this evaluation report, with contributions from the entire evaluation team.

APPENDIX 1

FINAL SURVEY REPORT AND ANNEXES

REPORT ON FINAL SURVEY:
PCI, Nicaragua
Child Survival VII Project
Acahualinca

Managua, Nicaragua
June 28 - July 12, 1994

Lit. Olga Viluce
External Consultant
Evaluation Coordinator
Dr. Leone] Arguello
Project Director, PCI/Nicaragua

PROJECT CONCERN INTERNATIONAL
3550 Afton Rd. San Diego, CA 92123
Phone: (619) 279-9690 Fax: (619) 694-0294

PCI/NICARAGUA - CSVII FINAL SURVEY

ANNEXES

EXECUTIVE SUMMARY

The Child Survival (CS) VII project was carried out by Project Concern International (PCI), a non-profit international health organization incorporated in the United States. PC1 is a registered Private Voluntary Agency with the U.S. Agency for International Development (USAID). The PC1 CSVII project in Nicaragua received $179,590 from USAID and was financed by the Bureau for Food for Peace and Voluntary Assistance/Office of Private and Voluntary Cooperation (FVA/PVC) to carry out the project from October 1, 1991 to September 30, 1994.

A survey of local health intervention knowledge, practice and coverage was carried out in the barrio of Acahualinca, district II of Managua, region III, Nicaragua, from June 28 to July 12, 1994. The purpose of the study was to provide final information about child survival knowledge and practices of mothers with children under two years of age. The survey and the resulting report served as a management tool to explore trends, significant changes, and refine project activities for replication in other barrios of Managua.

The questionnaire utilized for the study was initially drafted by PCI-Nicaragua and was based on a standardized format which A.I.D. requires of all PVO Child Survival projects. The questionnaire was further refined during field tests in Nicaragua. The field survey team received training in 30 cluster sample surveys from PCI-Nicaragua staff. The objectives of the survey were accomplished in two weeks.

The evaluation team discussed the results extensively in order to determine significance and comparability against the baseline data in measuring the project's goals and objectives. The results were used to make recommendations for the implementation of other CS projects in Nicaragua and Latin America.

The main findings of the study were:

- Improved care for infants, including improved breastfeeding practices, and consumption of vitamin A rich foods.
- Improved immunization coverage for both children and women of reproductive age.
- Improved enrollment in the health post's growth monitoring program.
- Increased knowledge of dehydration symptoms.
- Increased usage of PC1 trained health professionals for referrals and advice,

I. INTRODUCTION

A. Background Information

PCI-Nicaragua is part of Project Concern International, a United States Private Voluntary Organization with its headquarters in San Diego, California. PCI's CSVII project in Acahualinca represented its first activities in Nicaragua, where operations started in October, 1991, and ended in September, 1994. The goal of the project was to reduce child mortality and morbidity, particularly in children under 2 years of age, by increasing the coverage of MOH health programs and integrating the participation of the community into local health programming. The interventions originally proposed were:

1- Expanded Program of Immunization
2- Control of Diarrheal Disease
3- Acute Respiratory Infections (Pneumonia Control)
4- Maternal Care
5- Nutrition, Vitamin A and Growth Monitoring

B. Objectives of the Final Survey

The objective of the survey was to collect the information necessary to measure the achievement of PCI's objectives, as well as all project outputs.

This investigation measured the following:

1- The knowledge of mothers with children under two years of age related to:

   a) The main threats to children's health.

   b) The ways to prevent diseases or limit their complications and sequels. These practices are: use of immunizations, appropriate treatment for diarrhea, growth monitoring, weaning and appropriate feeding, and treatment for acute respiratory infections.

2- The practices of mothers related to the mentioned interventions and maternal care.

3- Coverage rates for immunizations in children under one year of age (by using a sample of children 12-24 months old),

4- Practices related to breastfeeding and weaning foods.

5- Prenatal control, TT coverage, the person who attended the delivery and the estimates of the proportion of mothers using a modern method of family planning.

C. Geographic Area and Population

The project was implemented in the barrio of Acahualinca, an urban community located in the western sector of Managua, Nicaragua. Acahualinca began the program with a population of 7,600 and PC1 estimates that the population of Acahuahnca has increased to about 9,000 residents that live in 1,500 houses with minimum sanitary conditions and very limited income.

Approximately 3.5% of the population are under 12 months of age, 19.3% are under 60 months of age and 25% of the population are women of reproductive age (15-45 years). Acahualinca is located in District 2 "La Morazan", Western SILAIS (Managua) as defined by the Ministry of Health (MINSA).

D. Schedule of Activities in Nicaragua

The survey activities were held from June 28 to July 12 (see appendix No. 1). These included:

Logistics
Training of supervisors
Training of surveyors
Pretesting/Correction of questionnaires and reproduction
Selection of houses to be surveyed
Collection of the information
Data recording
Data processing
Analysis of results
Document writing

II. METHODOLOGY

A. The Questionnaire

The questionnaire (see annex **3),** which contains 45 questions, was designed to collect information from mothers with children under 24 months of age. The questions were based on a standardized survey format which A.I.D. required of all PVO CS projects. The standardized survey instrument was developed by the staff at the Johns Hopkins University (PVO CSSP). PC1 further customized the standardized survey questionnaire making the finalized questionnaire more appropriate to the actual CS project interventions and the project area, while maintaining the limitation of keeping the final survey nearly identical to the

baseline survey. In retrospect, both surveys could have been improved, but would have required variations from the CSSP model.

The questionnaire was divided into seven parts or components:

I. Mothers' education and occupation
II. Breastfeeding/Nutrition
III. Child Growth Monitoring
IV. DiarrheaI diseases
V. Acute Respiratory Infections
VI. Immunizations
VII. Maternal Care

B. Determination of Sample Size

Sample sizes were calculated with the following formula:

$$n = z^2(pq)/d^2$$

where **n =** sample size; z = statistical certainty chosen; **p** = estimated prevalence/coverage rate/level to be investigated; **q** = 1 - **p;** and **d** = precision desired.

The value of **p** was defined by the coverage rate that requires the largest sample size **(p** = .5). The value of **d** depends on the precision, or margin of error, desired (in this case **d** = .l). The statistical certainty was chosen to be 95% (z = 1.96). Given the above values, the following sample size **(n)** needed was determined to be:

$$n = (1.96 \times 1.96)(.5 \times .5)/(.1 \times .l)$$
$$n = (3.84)(.25)/.01$$
$$n = 96$$

It takes considerable time to randomly select an individual from the survey population, and then perform this selection 96 times to identify a sample of **n** = 96. Time can be saved by conducting a 30 cluster sample survey in which several individuals within each cluster are selected to reach the required sample size. However, in order to compensate for the bias which enters the survey from interviewing persons in clusters, experience has shown that a minimum sample of 210 (7 per cluster) should be used given the values of **p, d, and z** above (Henderson, et. al., 1982). In general, when using a 30 cluster sample survey, the sample size used should be approximately double the value **n,** when: **n = (z x z)(pq)/(d x d).** In this case, a sample size of 300 (10 per cluster) was selected to ensure the minimum sample of 210 would be obtained.

The estimates of confidence limits for the survey results were calculated using the following formula:

95% confidence limit = p ± z(square root of {pq/n})

where: p = proportion in population found from survey; z = statistical certainty chosen (if 95% certamty chosen, then z = 1.96); **q** = 1 - **p;** and **n** = sample size

EXAMPLE: If the proportion of children in the survey who were completely and correctly immunized is 37% and **n = 297:**

95% confidence limit = .37 ±1.96(square root of {.37 x .63/297})
(z = 1.96)

1.96 = .37 ± .03 (or, 34% to 40%)

In other words, the team is 95% sure that the actual proportion of children in the survey area, who are completely and correctly immunized, is between 34% and 40%.

The analysis of confidence limits was conducted only for those responses that were potentially statistically significant when compared to baseline levels.

C. Selection of the Sample

It was decided to take a sample of 300 from the population of women with children under 24 months in Acahualinca. 30 clusters were selected according to the terms described in the WHO/OMS manual (Household Survey Manual: Diarrhoea Case Management, Morbidity and Mortality. WHO, Geneva, 1989).

14 surveyors in three teams and a supervisor for each team were selected, controlled by the survey coordinator. Each team interviewed mothers in the selected 30 clusters, making a total of 3 14 mothers of children under 2 years surveyed. Once in the community, the initial house was chosen at random, following the method described in the WHO manual, and from there the team proceeded to every third house, if they did not find a mother with children under two years, they proceeded with the next house until they found one, then started again at the third house. Due to the absence of mothers at home, the team had to go back and visit the houses that were not selected to achieve the number of mothers needed. By the end, nearly every house in the entire barrio was visited.

D. Training of Supervisors and Interviewers

The training of the field supervisors and the interviewers took place in two consecutive days, adhering to the following program:

1- Preparation of logistics in the office of PCI-Nicaragua and in Acahualinca for the application of the survey.

2- Meeting with the supervisors to explain the methodology, read and analyze the questionnaire, and incorporate suggestions and corrections.

3- Training of interviewers:

3.1 Explanation of the project's objectives, the survey's objective, the sample size, the target group and the role of supervisors and interviewers.

3.2 The group was divided into three sub-groups directed by three supervisors. The entire questionnaire was read, then they read all the questions that skip to other questions. Later the team held practice sessions between the interviewers about how to handle the immunization cards, maternal cards and growth monitoring cards.

3.3 Another practice session was held in which all the personnel participated to clear doubts and verify the correct handling of the questionnaire.

3.4 There was a performance ("sociodrama") where the groups role-played. The coordinator played the role of a mother and one of the groups played the role of interviewers, the rest were part of the jury and the public, with the mission of assessing and providing feedback to the surveyors. This process was replicated by each of the groups.

3.5 A second practice session was held in which all the personnel participated to clear doubts and verify the correct handling of the questionnaire.

3.6 Every interviewer had another opportunity to interview his/her partner under the guide of the supervisor. They repeated the exercise until they were familiar with the language and content and could handle the survey. Supervisors and interviewers made recommendations that were included in the questionnaire.

3.7 A third practice session was held in which all the personnel participated to clear doubts and verify the correct handling of the questionnaire.

3.8 Field practice and pretesting were conducted in a neighboring community. The team explained the map of the barrio of La Esperanza, located in Managua, with conditions

similar to Acahualinca, and every surveyor had to accomplish at least three interviews, one of them with the supervisor. After everyone finished, the team returned to the office to exchange feedback from the field experience.

4- The team introduced changes in the questionnaire and prepared all the logistics the team needed to start the final survey.

5- With a map, the coordinator of the survey, supervisors and PC1 staff made a visit to Acahualinca so that the supervisors got oriented. This helped us to locate the newly constructed houses the team needed to visit but were not part of the baseline sample.

6- Clusters were defined after the field visit, assigning different clusters to each supervisor. Every questionnaire was numbered to avoid any problems.

E. Conducting Interviews

The interviews took place on two consecutive days, Saturday the 2nd and Sunday the 3rd of July, 1994. The choice as to who would go to the 30 clusters to interview the people was made by the coordinators of the project and the field supervisors, who took into account the staffs knowledge of the territory and the voluntary health care workers in each community.

The supervisors of each team were responsible for the selection of the actual cluster surveyed, as well as the starting household and direction, which was determined to be clock-wise. The supervisors observed at least two complete interviews by each surveyor each day. Each questionnaire was checked twice for completeness before the survey team left the survey area, so that, in the case of missing or contradictory information, the mother could be visited again the same day. This avoided the risk of losing any records.

In order to ensure consent and confidentiality, a consent form was presented to the mothers for each survey questionnaire. The consent form advised the potential respondent that she was not obligated to participate in the survey, and that no services would be withheld from her if she chose not to participate. The consent form also assured the mother that all information would be held in confidence, and that the information would be used to help health workers evaluate health activities.

F. Method for Data Analysis

Two teams entered the data into the EPI/INFO 5.1 b software program; this required two days. For the first draft of the survey report, the PC1 staff obtained frequency distributions for each of the questions. In the majority of the cases EPI/INFO was used to cross tabulate the results with the child's age. Once the frequency tables and some cross tables were finalized, further

cross tabulations were performed on EPI/INFO. Confidence intervals were developed for responses that appeared to be statistically significant when compared to the baseline. Afterwards, the survey report was edited and finalized.

III. RESULTS

The following responses were given to the 45 questions which made up the questionnaire. Data from 3 14 respondents were put into EPI/INFO. ***The bolded items reflect statistically significant changes that reflect upon the program's progress and impact. Other data presented for both baseline and final surveys should not be used for comparisons. They are presented to show trends and provide detail to project managers.*** The small sample size for many of the questions created large confidence intervals that prevented comparison of results. A larger sample would be required for both the baseline and final surveys to allow for a question-by-question comparison of small changes.

1. Age Distribution

The mean age of mothers with children under 24 months in the survey was 24 years, similar to the baseline survey (March, 1992). The youngest reported age was 14 and the oldest person interviewed was 50 years old. Half of the total mothers were 23 years old or under. 47 mothers surveyed were ages 19 years or younger, and 18 were ages 35 or older for a total of 37 of the 3 14 (12%) being considered as high-obstetric risk, compared with the baseline (32%)[with confidence intervals of +/- 5.19% at the baseline and +/- 3.5% at the final]. **It appears that fewer women ages < 15 or > 45 years old were having children during the past two years.**

TABLE No. 1 AGE OF SURVEYED MOTHERS	BASELINE	FINAL
Number of Mothers surveyed	303	314
Mothers mean age	25	24
"High-OBSTETRIC risk" group (mothers under 15 years old and over 45 years)	**32%**	**12%**
Age of the youngest mother	16	14
Age of the oldest mother	**42**	**50**

171 of the 3 14 mothers surveyed reported the age of their child as being between O-l 1 months. The mean age was 11 months. 143 of 3 14 children (46) were reported as being between the ages of 12-23 months. Similar **data** was obtained in the baseline survey.

TABLE No. 2 AGE OF THE CHILDREN	BASELINE	FINAL
Children between O-l 1 months age	54%	53%
Mean age (months)	11	11

2. Mothers Education and Income Generation Activities

135 (43%) of 3 14 mothers surveyed reported having primary education and that they could read. 129 (41 %) of 3 14 mothers reported having a secondary or higher level of education. Therefore, 21 mothers reported having no education, and 29 mothers reported having a primary school education but no reading ability.

TABLE No. 3 MOTHERS' EDUCATION	BASELINE	FINAL
No education	8%	7%
Primary education but can not read	3%	9%
Primary education and can read	59%	43%
Secondary or higher level	28%	41%
Illiterate	2%	0%

56 mothers (18%) reported they worked away from home. 173 mothers (55%) reported that relatives took care of the child when the mother was away from home for any reason. 59 mothers (19%) reported that they took the child with them when they were away from the home. 41 mothers (13%) reported that they left the child with an older child when the mother left the household. 37 mothers (12%) answered that the husband took care of the child when the mother was away, and 15 mothers (5%) answered that they left the child with a neighbor when away from home.

TABLE No. 4 MOTHERS' EMPLOYMENT AND CHILD CARE	BASELINE	FINAL
Mothers working away from home	24%	18%
Relatives take care of child	55%	55%
Mothers take child with them	19%	19%

Older children take care of child	15%	13%
Husband take care of child	8%	12%
Neighbors take care of child	4%	5%
Left in nurseries	1%	1%
Maid takes care of child	2%	3%

3. Breastfeeding and Nutrition

160 mothers (5 1%) reported that they were breastfeeding their child at the time of the survey. 154 mothers (49) were no longer breastfeeding. This figure was same as the one in the baseline. **Nevertheless, it was observed that 39 children under 4 months, (89%) were being breastfed compared with 73% reported in the baseline** [with a confidence interval of +/- 4.9% at the baseline and +/- 3.46% at the final]. **36% of these children were being exclusively breastfed compared with 15% in the baseline** [with a confidence interval of +/- 3.97% at the baseline and +/- 5.31% at the final].

The difference obtained between the baseline and final surveys is one of the products of mother's health education developed by PCI-Nicaragua (mothers of newborns club, brigadistas, house-to-house visits and better relations between all of them with the MOH health workers).

132 (86%) of the 154 mothers who were no longer breastfeeding reported having breastfed their child in the past, which was similar to the 89% reported in the baseline.

Of the 292 mothers who had breastfed or were still breastfeeding their child, 118 (40%) first gave breast milk to their child within the first hour after delivery. 75 (26%) first gave breast milk to their child within the first eight hours after delivery. This low level could be explained because 87% of the deliveries were at the hospital and they did not always allow the newborn to be immediately with his/her mother. 93 (32%) did not give their child breast milk until more than eight hours after delivery, similar to the baseline (31%). Six mothers did not remember when they first gave breast milk to their child, PC1 found exactly the same proportion of mothers in the baseline.

53% of the children who have reached 12 months of age are currently being breast-fed and 36% of the children 13-23 months are still being breastfed.

TABLE No. 5 BREASTFEEDING	BASELINE	FINAL
Mothers currently breastfeeding their child	51%	51%
Children under 4 months currently being breastfed	73%	89%
Children under 4 months exclusively being breastfed	**15%**	36%
Mothers no longer breastfeeding that have done it in the past	89%	86%
Mothers who first gave breast milk to their child within the first hour after delivery	48%	40%
Mothers who first gave breast milk to their child within the first eight hours after delivery	19%	26%
Mothers who did not give their child breast milk until more than eight hours after delivery	31%	32%
Children O-12 months of age and currently being breastfed	50%	53%
Children 13-23 months that are currently being breastfed	29%	36%

Of the 314 mothers surveyed, 79% were giving intense yellow colored fruits to their children, compared to 75% in the baseline and 54% **were receiving green leafy vegetables, compared with 10% (baseline)** [with a confidence interval of +/- 3.3% at the baseline and +/- 5.51% at the final]. **The change in green leafy vegetable consumption is significant because it represents a first step towards improvement in the way mothers feed their children. It is also surprising given the high cost and low access for these items.**

76% of the same group were also giving high protein foods, such as meat and fish, 79% beans and soya, 71% eggs. 89% of the children were being given high-calorie foods, such as sugar or honey, and 81% fats and oils.

TABLE No. 6 CHILD FEEDING	BASELINE	FINAL
Children being given:		
- Milk in bottle or cup	87%	85%

Cereal	48%	47%
Fruit or juice	82%	91%
intense yellow type fruits	75%	79%
green leafy vegetables	**10%**	54%
foods high in protein, such as meat and fish	79%	76%
beans and soya	82%	79%
eggs	75%	71%
high-calorie foods such as sugar or honey	67%	89%
- fats and oils	54%	8 1%

To measure mothers' knowledge in relation to Vitamin A, they were asked about which vitamin prevents night blindness, and 90% answered they did not know. PCI's health education did not focus attention on the night blindness issue because night blindness is not a health problem in Acahualinca. PCI's efforts emphasized the importance of Vitamin A consumption for overall nutrition because the findings in the baseline showed a very poor ingestion of food rich in vitamin A.

When mothers were asked about what foods are rich in Vitamin A, 35% provided correct answers, as well as 8 mothers who selected breast milk. This showed a positive trend when compared with 25% in the baseline.

TABLE No. 7 VITAMIN A	BASELINE	FINAL
Mothers who know Vitamin A prevents night blindness	5%	10%
Mothers who know what foods are rich in Vitamin A	25%	35%

4. **Growth Monitoring**

From 3 14 mothers surveyed, 216 (69%) had growth monitoring cards. 25 mothers (8%) reported they lost the card and 73 (23%) mothers reported they did not have a card for their child. Of the 98 mothers who had lost or had no card, 9 (10%) had children under 4 months of age, and 39 (27%) were from ages 5-12 months. Both of these results show positive trends from the baseline.

The proportion of children under 1 year of age weighed showed an improving trend from 73% at the baseline to 84% at the final. **161 children under two years had been weighed in the four months prior to the survey or 75% of the 216 children for which mothers had a growing monitoring card [+/- 5.77%], and 51% of the children of all 314 mothers in the survey [+/- 5.53%], as compared with 60% [+/- 6.94%] and 37% [+/- 5.37%] respectively (baseline). This shows that more children were being enrolled in the growth monitoring program.**

TABLE No. 8 GROWTH MONITORING	BASELINE	FINAL
Mothers who have growth monitoring cards	60%	69%
Mothers who have lost or do not posses a card	39%	31%
Mothers who have lost or do not posses a card and have children under 4 months of age	43%	10%
Mothers who have lost or have no card and have children 5-12 months age	40%	27%
Children with GM cards weighed in the four months prior to the survey	60%	75%
Children of all 314 mothers weighed in the four months prior to the survey	**37%**	**51%**

5. Diarrhea1 Diseases

110 of the 3 14 mothers surveyed (35%) reported that their child had diarrhea in the two weeks prior to the survey. The increase from the baseline (though not statistically significant) could reflect the seasonality of the disease. It its expected that diarrhea incidence increases in the rainy season. In fact, the minimal increase during this period, positively reflects upon PCI's efforts in Acahualinca.

Reviewing the specific rate among age groups by months, the prevalence of diarrhea was as follows:

- 2% (1) for children under 4 months [conf. interval +/- 4.39%]
- 41% (52) for children 4-11 months
- 21% (4) for children 12 months
- 43% (53) for children 13-23 months

The baseline showed the highest risk group for diarrhea being children from 4-11 months of age. In the final survey the team expected to have similar results for this group, which ended up in second place. **The team observed that the diarrhea rate for children under 4 months decreased dramatically.**

It can be concluded that PCI's health education efforts during the life of the project reached the mothers. They practiced better care for their children's diarrhea, particularly for newborns. They were taking protective measures such as increased breastfeeding, more exclusive breastfeeding (see table No. 5) and improving the personal hygiene practices -- also observed in the mothers meeting held with the evaluation team.

TABLE No. 9 PREVALENCE OF DIARRHEA	BASELINE	FINAL
Children who had diarrhea in the two weeks prior to the survey	**26%**	**35%**
Specific rate among age groups: - Children under 4 months	**18%**	**2%**
Children 4-l 1 months	**32%**	41%
Children 12 months	13%	21%
Children 13-23 months	**27%**	**43%**

A) Breastfeeding during diarrhea

Only 19% (21) [+/- 7.33%] of mothers breastfed their child more often, which showed a positive trend (9%) [+/- 6.2%] from the baseline. 19% (21) breastfed as often. Nevertheless, 7% answered incorrectly, similar to the result of 9% in the baseline survey.

When looking at the 110 children under two years of age that had diarrhea in the last two weeks, it was found that 48% were receiving breast milk. **The proportion of children under 4 months with diarrhea that received breast milk was 87% [+/- 8.36%], demonstrating improvement from the level of 50% [+/- 9.3%] in the baseline.**

TABLE No. 10 BREAST FEEDING DURING DIARRHEA	BASELINE	FINAL
Mothers who breastfed their child more often	9%	19%
Mothers who breastfed their child as often	**36%**	19%
Mothers who breastfeed their child incorrectly:	9%	**7%**

Mothers who breastfed their child less than usual	5%	5%
Mothers who stopped breastfeeding their child	4%	2%
Children under two years of age that had diarrhea in the last two weeks that were receiving breast milk	50%	48%
Children under four months of age that had diarrhea in the last two weeks that were receiving breast milk	50%	87%

B) Administration of fluids other than breast-milk

29% [+/- 8.48%] of the mothers give more fluids than usual; a positive trend from baseline results (19%) [+/- 7.33%]. At the same time, the mothers that had inadequate practices decreased an insignificant amount from 70% (baseline) to 64% (final survey).

TABLE No. 11 FLUIDS DURING DIARRHEA	BASELINE	FINAL
Mothers that gave more fluids than usual	19%	29%
Exclusively breastfed	11%	7%
Mothers surveyed that showed an inadequate practice during diarrhea	70%	64%
Gave fluids same as usual	44%	40%
Gave fluids less than usual	21%	21%
- Stopped completely	5%	3%

C) Administration of solid/semisolid foods during diarrhea

Only 45% of the mothers surveyed answered correctly: 3% said more than usual, 29% (32) same as usual and 13% (14) exclusively breastfed. The rest answered incorrectly as follows: 34% (37) less than usual and 22% (24) stopped completely.

TABLE No. 12 FEEDING SOLID/SEMISOLID FOODS DURING DIARRHEA	BASELINE	FINAL
Mothers surveyed that showed an adequate solid/semisolid food feeding practice during diarrhea	59%	45%
gave more than usual	9%	3%
- same as usual	30%	29%
exclusively breastfed	20%	13%
Mothers who gave less than usual solid/semisolid foods	26%	34%
Mothers who stopped completely giving solid/semisolid foods	15%	22%

D) Treatments administered during diarrhea

From the 110 mothers that reported children with diarrhea in the two weeks prior to the survey, 4.5% (5) did not administer any treatment,

The group of mothers who administered a treatment gave 105 answers, many of them related to anti-diarrheal, antibiotic medicines and purgatives, showing incorrect practices.

Of the total, 68% (75) mothers recalled appropriate case management of diarrhea. Answers were 77% (58) ORS sachet, 7% (5) gave a "sugar-salt solution", 12% (9) gave fluids and 4% (3) cereal based solutions. None of these results were significantly different from the baseline results.

TABLE No. 13 TREATMENT DURING DIARRHEA	BASELINE	FINAL
Mothers surveyed that showed an adequate practice during diarrhea	57%	69%
gave oral rehydration salt	46%	53%
home made ORT	5%	5%
cereal solution	0%	3%
home fluids	6%	8%

Mothers that gave anti-diarrhea1 or antibiotics	59%	65%
Mothers who gave other treatment	3%	17%
Mothers who didn't give anything	13%	5%

Out of these 110 women, 74 mothers (67.3%) reported seeking advice for the child's diarrhea. 47 (63.5%) went to a health center, 5 (6.8%) to the community health worker, 18 (24.3%) sought advice from friends and relatives, 5 (6.8%) to a general hospital, 4 (5.4%) to a private doctor/clinic, 3 (4.1%) to a drugstore, the rest is distributed among others without showing any trend, other than the fact that more women appear to be using PC1 trained health workers for advice.

TABLE No. 14 DIARRHEA ADVICE	BASELINE	FINAL
Mothers who sought advice for their child's diarrhea	54%	67%
Mothers who sought advice from:		
health center	51%	64%
traditional healer	0%	1%
traditional birth attendant	0%	3%
community health worker	2%	7%
friends and relatives	24%	3 7%
general hospital	2%	7%
private doctor/clinic	7%	5%
drugstore	5%	4%
others	0%	3%

3 14 mothers were asked what signs or symptoms would lead them to seek advice or treatment for their child's diarrhea. 3.5% (11) mothers surveyed answered that they did not know. The rest of the answers were as follows:

33.5% (105) reported vomiting
29.6% (93) said fever
37.3% (117) with signs or symptoms related to dehydration,
(dry mouth, sunken eyes, or decreased urine

output)
6.1% (17) prolonged diarrhea (more than 14 days)
1.6% (5) blood in stool
15.6% (49) decreased appetite
15.0% (47) weakness or tiredness

A significant positive change from the baseline was the identification of dehydration symptoms as a leading impetus for mothers to seek care for their child; 37% [+/- 5.34%] at the final as compared to 12% [+/- 3.61%] at the baseline.

Within the other answers, 15% stated the increase in the frequency of stools, and 5% indicated child irritability.

TABLE No. 15 KNOWLEDGE OF THE SIGNS AND SYMPTOMS OF DIARRHEA	BASELINE	FINAL
Mothers that will seek advice or treatment for their child's diarrhea according to the following signs or symptoms:		
do not know	15%	4%
vomiting	33%	33%
fever	24%	30%
signs or symptoms relating to dehydration, (dry mouth, sunken eyes, or decreased urine output)	**12%**	37%
prolonged diarrhea (more than 14 days)	33%	6%
blood in stool	3%	2%
decreased appetite	11%	16%
weakness or tiredness	5%	15%

In relation to feeding during the child's recovery from diarrhea, 17 (5.4%) out of 314 mothers surveyed answered that they did not know. Of other answers: 52.2% (64) giving less but frequent foods, 10.2% (32) more food than usual, 5.4% (17) high caloric food. In general, 67.8% (113) mothers had a correct view of feeding during their children's diarrheal episodes.

TABLE No. 16 MANAGEMENT OF DIARRHEAL FEEDING	BASELINE	FINAL
Mothers' knowledge about feeding during a child's recovery from diarrhea: do not know	16%	5%
giving smaller, more frequent feeds	0%	52%
- more food than usual	16%	10%
high caloric food	5%	12%
Mothers who responded with other correct answers.	95%	95%

6. Acute Respiratory Infections

The prevalence of acute respiratory infections (ARI-child with cough) two weeks prior the survey was 70% (220). The specific rates by age group were as follows:

- 55% (24) children under 4 months
- 79% (100) children 4-l 1 months
- 68% (13) children 12 months
- 67% (83) children 13-23 months

The group from 4 to 11 months showed the highest prevalence, followed by the 12 month age group. The levels of risk were similar to those in the baseline. Nevertheless, the team expected to see a higher level of ARI, because the rains (May-November) increase the prevalence. The risks for all groups did not significantly change when compared with the baseline (March, 1992). The risk reduction in children under 4 months, may be explained by the mothers' improvements in taking care of their children, breastfeeding, etc.

TABLE No. 17 PREVALENCE OF ARI BY AGE	BASELINE	FINAL
Prevalence of ARI two weeks prior to the survey	65%	70%
Specific rate by age group: Children under 4 months	59%	55%
Children 4-l 1 months	70%	79%
Children 12 months	75%	68%

Children 13-23 months	67%	64%
Children with difficulty breathing in past 15 days	37%	32%

Regarding breastfeeding of children under 4 months affected by ARI, it was observed that 87% of these children were receiving the benefits of this practice. PC1 reported 50% in the baseline. The small sample size prevented us from confirming a change in the mothers' practices. However, there was an encouraging trend toward improvement.

When asked if the child was ill coughing and experienced difficult breathing (dyspnea) in the last two weeks prior to the survey, 101 mothers answered affirmative. This means that 32% of the children under two years may have an increase in the gravity of their illness, regardless of their current symptoms. This figure is not significantly different than the baseline. The team expected to have a higher percentage, nevertheless, this reduction may be explained by the changes in mothers' practices previously mentioned.

TABLE No. 18 CARE OF CHILDREN WITH ARI	BASELINE	FINAL
Children under 4 months with ARI (cough) being breastfed	50%	87%
Mothers who sought advice for children with difficulty breathing in past 15 days	57%	46%

77 (76%) of the 101 mothers with children displaying respiratory illness symptoms sought advice, not a significant change from the baseline. Of the mothers that received advice or help, their sources were the following: 64% (50) health post/center, 22% (17) relatives and friends, 19% (15) general hospital, 5% (4) private doctor/clinic, 2.6% (2) community health worker and 1% (1) drugstore.

Compared to the baseline, the main trend was the improved popularity and respect mothers had for the general hospital, health center and community health volunteers (brigadistas); it may be due to people's confidence with the health services and the brigadistas, who made referrals to the health services.

TABLE No. 19 ADVICE FOR ARI	BASELINE	FINAL
Mothers with children with signs of ARI who sought advice	70%	76%
Sources from where mothers received advice : general hospital	13%	19%
- health post/center	54%	64%
private doctor/clinic	8%	5%
drugstore	4%	1%
community health worker (brigadistas)	0%	3%
relatives and friends	27%	22%
traditional birth attendance	0%	0%
traditional healer	1%	0%

3 14 mothers were asked what signs or symptoms would cause them to seek advice or treatment for their child's respiratory illness. 10% (3 1) answered that they did not know. 61% (190) responded with signs or symptoms relating to dyspnea (i.e. fast and difficult breathing), 9% (29) said chest indrawing, 13% (40) decreased appetite, 38% (120) stated that fever was such a sign or symptom, 30% (93) responded to this question with cough, and 23% (73) responded with a sign or symptom "other" than one of the responses on the questionnaire. All "other" answer were correct. The results compared with the baseline (cough, fever, decreased appetite and chest indrawing) showed an improving trend. More mothers appeared aware. This should contribute to less children with complications of ARI,

TABLE No. 20 KNOWLEDGE OF ARI SIGNS/SYMPTOMS	BASELINE	FINAL
Signs or symptoms that would cause mothers to seek advice or treatment for their child's respiratory illness: did not know	15%	10%
fast and difficult breathing	60%	61%
chest indrawing	6%	9%
decreased appetite	5%	13%

fever	24%	38%
cough	20%	30%
other	21%	23%

7. **Immunizations**

From the 3 14 interviewed mothers, 98% (308) responded that their child had been immunized. When asked at what age their child should receive the measles vaccine, 51% (159) answered at nine months, compared with 42% in the baseline. 16% (50) responded before nine months, and 18% after nine months. 19% of the mothers answered they did not know.

PCI-Nicaragua believed that the mothers' lack of knowledge regarding the age for the measles vaccine could be due to confusion during a recent MOH measles campaign which requested that all children (9 months to 14 years old) receive a measles vaccine.

TABLE No. 21 IMMUNIZATIONS	BASELINE	FINAL
Children who have received at least one immunization	96%	98%
Age children should receive measles vaccine: 9 months	42%	51%
less than 9 months	15%	16%
more than 9 months	18%	15%
did not know	25%	19%

36% (113) mothers interviewed answered that the main reason why a pregnant woman needs to be vaccinated with the tetanus toxoid vaccine was to protect **both** the mother and the newborn against tetanus. 61 mothers responded that the tetanus toxoid vaccine would protect **only** the newborn, and 20% (63) responded that the vaccine would protect **only** the mother. 25% (77) mothers responded that they did not know the reason why a pregnant woman needs to be vaccinated with the tetanus toxoid vaccine.

24% (74) [+/- 4.72%] of mothers interviewed knew that a pregnant woman should receive at least two tetanus toxoid injections, 33% (104) [+/- 5.20%] knew that a pregnant woman should receive more than two doses. The total for these two answers compared with the baseline total (20%) [+/- 4.45%] increased significantly. 12% (36) mothers stated that a pregnant woman should receive one TT injection and 32% (99) stated

either no doses or that they did not know how many TT injections a pregnant woman should get.

TABLE No. 22 TETANUS	BASELINE	FINAL
Mothers who know that a pregnant woman needs to be vaccinated with the tetanus toxoid vaccine to protect **both** the mother and the newborn against tetanus	45%	3 6%
Mothers who know that a pregnant woman should receive at least two tetanus toxoid injections	20%	57%

Most of the 3 14 children 84% (264) had their immunization cards. 6% (20) reported losing the immunization card and 10% (30) did not have it.

TABLE No. 23 CHILD IMMUNIZATIONS CARDS	BASELINE	FINAL
Mothers that have their child's immunization card	78%	84%
Mothers that have lost their child's immunization card	7%	6%
Mothers that do not have an immunization card for their child	15%	10%

Immunization coverage recorded on children's immunization cards was cross tabulated with the age of the child using EPI/INFO. The results showed that there were 171 children under 12 months. From them, 13% (19) had universal coverage by this age (3 doses of anti-polio, 3 DPT doses, one dose of measles and one of BCG), compared with the baseline, there was an insignificant increase.

TABLE No. 24 IMMUNIZATION COVERAGE	BASELINE	FINAL
Children under 12 months with universal coverage	8%	13%
Coverage by immunization for children under 12 months:		
BCG	73%	93%
Antipolio 3	20%	49%
DPT 3	21%	49%
Measles	8%	14%

N=19

Making an analysis by vaccine, it was observed that children under 12 months old had the highest coverage with BCG: 93% [+/- 3.82%] and followed by Antipolio and DPT3 with 49% [+/- 7.49%] for each of them. Compared with the baseline levels for BCG (73%) [+/- 3.43%], Antipolio 3 (20%) [+/- 6.04%], and DPT (21%) [+/- 6.16%] the increases were significant.

TABLE No. 25 IMMUNIZATION COVERAGE	BASELINE	FINAL
Children 12-23 months with universal coverage	59%	**72%**
Coverage by immunization for children 13-23 months: BCG	**75%**	**88%**
Antipolio 3-6	**65%**	**88%**
DPT 3	**64%**	**86%**
Measles	**59%**	**85%**

Regarding the 143 children 12-23 months, 72% (83) [+/- 7.36%] had universal coverage (3 to 6 anti-polio doses, 3 DPT doses, one measles dose and one BCG). Compared with the baseline (59%) [+/- 8.30%], there was no significant increase.

Making an analysis by vaccine, it was observed that children 12-23 months old had a positive trend of improving vaccination coverage. Coverage for BCG appeared to improve from 75% [+/-7.3%] at the baseline to 88% [+/-5.33%] at the final. Coverage for Antipolio (88%) [+/-5.33%] was above the baseline level (65%) [+/-8.05%]. Coverage for DPT 3 (86%) [+/-5.69%] was also above the baseline (64%) [+/- 8.1%). Likewise, measles coverage (85%) [+/-5.85%] showed improvement from the baseline (59%) [+/- 8.3%].

8. Maternal Care

Of the 3 14 mothers interviewed, 53% (165) had their immunization card, 15% (48) lost their cards and 32% did not have a card. Reviewing the cards, 6% (10) were not vaccinated, 30% (50) had incomplete vaccination, and 64% (105) had complete vaccinations.

All this demonstrated an improving trend of retention of the immunization card, and an increasing trend of mothers immunized when compared with the results of the baseline.

TABLE No. 26 TETANUS TOXOID	BASELINE	FINAL
Mothers with immunization card	39%	**53%**
Mothers with immunization card lost	17%	15%
Mothers with no immunization card	**44%**	**32%**
Mothers not vaccinated	**6%**	**6%**
Mothers with incomplete vaccination (TT 1 dose)	**36%**	**30%**
Mothers completely vaccinated (TT 2 doses or more)	59%	**64%**

44% (137) of mothers interviewed answered that they had a prenatal card, 35% (110) did not have it and 21% (67) had lost it. Reviewing the cards of the mothers who had them, 53% (73) had the MOH norm complete (four prenatal visits).

Only 8% (24) of the interviewed mothers reported that they were pregnant at the time of the survey. When verifying their prenatal card, only 46% had one. **When crossing pregnant mothers with prenatal card and TT two doses, the result was that 76% [+/- %] were immunized; comparing this with the baseline (46%) [+/- %] it shows an improving trend.** The sample size was too small for the results to be statistically significant.

TABLE No. 27 MATERNAL CARE	BASELINE	FINAL
Mothers with prenatal card	35%	44%
Mothers with prenatal card who had MOH norm complete (4 prenatal visits).	56%	53%
Mothers pregnant at the time of the survey	14%	8%
Mothers pregnant with prenatal card	27%	46%
Mothers pregnant with card immunized against TT (2 doses)	46%	76%

Of 290 mothers who were not pregnant, 89% (258) did not want to be pregnant in the next two years, but only 62% (161) were using a family planning method; both figures represent rising trends from the baseline. The most common family planning methods reported in the final were the temporary methods such as IUDs (44%), pills 24% (70), and the barrier method/diaphragm. The permanent methods were not as popular, with 17.4% (28) mentioning tubal ligation.

It is important to outline that only 4.3% (7) of the women used breastfeeding to prevent pregnancy and only 4.3% (7) used condoms.

TABLE No. 28 FAMILY PLANNING	BASELINE	FINAL
Mothers who do not want to become pregnant in the next two years	86%	89%
Mothers using family planning methods	51%	62%
Family planning methods used: pills	33%	24%
IUD	30%	44%
barrier method/diaphragm	0%	0%
condoms	3%	4%
tubal ligation	21%	17%

depoprovera and others	4%	5%
rhythm method	1%	1%
abstinence	1%	1%
coitus interruptus	1%	1%
exclusive breastfeeding	5%	4%

93% (291) mothers interviewed stated that a pregnant woman should see a health professional in the first trimester of pregnancy. 4% (13) stated that a woman should see a health professional in the second trimester of pregnancy, and 0.3% (1) stated that the third trimester was the first time a pregnant woman needed to see a health professional. 1% (2) stated that there was no need for a pregnant woman to see a health professional, and 2% (7) stated that they did not know when a pregnant woman should first see a health professional.

TABLE No. 29 MATERNAL CARE	BASELINE	FINAL
Mothers who know that a pregnant woman should see a health professional in the first trimester of pregnancy	88%	93%

When asked what symptoms during pregnancy would prompt them to seek help or treatment, 44% (13 7) said hemorrhage, 39% (123) said "others", which included nausea, vomit, fever, lumbar pain and renal infection. Another important answer was "did not know" with 22% (68), followed by 19% (59) headache and blurred vision and 5% (17) swelling in hands and feet. Results were similar to the baseline survey.

TABLE No. 30 MATERNAL CARE	BASELINE	FINAL
Signs or symptoms during pregnancy that will make mothers seek help:		
hemorrhage	42%	44%
- headache and blurred vision	18%	19%
swelling in hands and feet	3%	5%
- other	36%	39%
- did not know	22%	22%

86% (269) of mothers interviewed stated that a health professional (doctor, nurse) cut the umbilical cord from her last child, 11% (35) said it was a midwife, and 2% (6) stated a relative.

TABLE No. 31 PREGNANT CARE	BASELINE	FINAL
Person who cut the umbilical cord from the last child of mothers:		
- health professional	87%	86%
midwife	9%	11%
relative	4%	2%

The mothers' time living in Acahualinca at the moment of the survey, were as follows: 5% (16) between 0 and 3 months, 3% (8) between 3 and 6 months, 4% (13) between 6 and 12 months, 10% (30) between 1 and 2 years and the majority 79% (247) has been living there for more than 2 years.

IV. CONCLUSIONS AND RECOMMENDATIONS

Overall, the project was positively reviewed by both the evaluation team and the community participants. All activities proposed were undertaken, with unanticipated benefits being achieved with cholera education and the privately funded hygiene and sanitation initiative. The following recommendations are directed at both PC1 management, as well as the donor agency to improve future activities in Acahualinca, Nicaragua, and throughout the world.

1. The positive changes between the baseline and final surveys related to breastfeeding and nutrition are products of mother's health education methodologies developed by PCI-Nicaragua (mothers of newborns club, brigadistas, house-to-house visits and better relations between all of them and the MOH health workers). These methodologies should be continued in Acahualinca and replicated in other urban areas of Nicaragua.

2. The diarrhea rate for children under 4 months decreased dramatically. At the same time, the use of exclusive breastfeeding increased. This evaluation could not prove causality between these results, however, the results were encouraging and should be shared with other organizations operating similar projects.

3. It can be concluded that PCI's health messages reached the mothers and were incorporated into their daily lives. They were practicing better care for their children, particularly newborns. They were aware of protective measures such as increased breastfeeding, more exclusive breastfeeding, increased consumption of vitamin A rich foods, and improving personal hygiene practices. Future programs should adapt the specific messages which were effective in Acahualinca.

4. PCI's immunization and tetanus toxoid activities appeared to have increased both knowledge and coverage. Maintenance of the maternal and child health cards by mothers contributed to the coverage improvements. Future immunization efforts should explore the use of "mini-campaigns" similar to the process implemented by PCI. Ideally, a household registration system can be developed to allow for each child born to be registered and tracked through the first year of life.

5. The baseline and final surveys could have been better adapted to the project's educational activities. By repeating the same questionnaire as the baseline, the final evaluation survey instrument did not fully meet the needs of the project. Extending the length would have increased costs beyond the approved budget, and modifying the survey could have created significant biases. Future surveys should not be adhere as stringently to the CSSP model questionnaire,